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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/901,500 | 07/03/2001 | Chia-Pin Lin | JCLA7208 | 5186 |
| 7590 09/13/2004 | | | | |
| J.C. PATENTS INC. Suite 250 4 Venture Irvine, CA 92618 | | | EXAMINER GOFF II, JOHN L | |
| | | | ART UNIT 1733 | PAPER NUMBER |

DATE MAILED: 09/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/901,500

Applicant(s)

LIN ET AL.

Examiner

John L. Goff

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,7,8,10,11,13-19,22 and 23 is/are pending in the application.
- 4a) Of the above claim(s) 10,11,22 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,8 and 13-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is in response to the amendment filed on 6/1/04. The previous 35 USC 112 rejections have been overcome.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
4. Claims 1-4, 7, 13-16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosomi et al. (U.S. Patent 5,806,177) in view of the admitted prior art (Specification pages 1, 2, and 6).

Hosomi et al. disclose a method for laminating copper foil onto an internal printed circuit board (PCB). Hosomi et al. teach the method comprises providing an internal PCB (e.g. epoxy-glass fabric substrate having a circuit formed on at least one of its surfaces), coating isolating material (e.g. liquid epoxy polymer resin described as undercoating agent) onto the upper and

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lower surfaces of the internal PCB using a roller coater, curing (at least partially) by irradiation the isolating materials to form tack-free layers having a predetermined thickness, placing metal foils (e.g. copper foils) also coated with uncured or semi-cured isolating material (e.g. liquid epoxy resin) onto the irradiation cured isolating layers of the internal PCB to form a multilayer PCB, and then heating and pressing the multilayer PCB to completely heat cure the isolating materials and secure the metal foils to the internal PCB (Figures 1A-2C and Column 3, lines 35-67 and Column 4, lines 1-3 and Column 10, lines 7-21 and 43-37 and Column 11, lines 1-5). It is noted Hosomi et al. are silent as to determining the thickness of the isolating material/layers according to the type of metal foil used. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use any well known and conventional technique to determine the thickness of the insulating material/layers taught by Hosomi et al. such as according to the type of metal foil used as it was well known in the art to determine the thickness in this manner as shown for example by the admitted prior art (e.g. to control the requirements of the PCB circuit), it being noted only the expected results would be achieved.

The admitted prior art discloses it was known to laminate copper foil to a substrate through a layer of insulating material to form a PCB (Page 1, lines 17-23). The admitted prior art teaches it was known that the thickness of the insulating layer was restricted to the type of copper foil used (Page 1, lines 23-24 and Page 2, lines 1-2 and Page 6, lines 16-18).

Furthermore, the admitted prior art teaches that the thickness of the isolating layer of the PCB can affect the Radio frequency (RF) properties and impedance of the circuit. Therefore the

thickness of the PCB is controlled according to the requirements of the circuit properties (Page 2, lines 3-5).

5. Claims 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosomi et al. and the admitted prior art as applied to claims 1-4, 7, 13-16, and 18 above, and further in view of Takahashi et al. (U.S. Patent 4,400,438).

Hosomi et al. and the admitted prior art teach all of the limitations in claims 5 and 17 as applied above except for a teaching of using insulating material comprising polyimide. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the insulating material taught by Hosomi et al. material comprising polyimide or polyimide and epoxy as it was well known in the art to include polyimide in the insulating material to increase the heat resistant properties of the insulating material as shown for example by Takashi et al.

Takahashi et al. (particularly the background of Takashi et al.) disclose it was known in the art of forming PCBs to use as the insulating material one comprising polyimide or polyimide and epoxy as the polyimide provides not only excellent heat resisting properties but also good fire or flame retardant properties (Column 1, lines 15-23 and 35-37).

6. Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosomi et al. and the admitted prior art as applied to claims 1-4, 7, 13-16, and 18 above, and further in view of Yates et al. (U.S. Patent 6,270,648).

Hosomi et al. and the admitted prior art teach all of the limitations in claims 8 and 19 as applied above except for a teaching on using treated copper foils, although it is noted Hosomi et al. are not limited to any particular type. It would have been obvious to one of ordinary skill in

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the art at the time the invention was made to use as the copper foils taught by Hosomi et al. ones that have been treated to produce low profile, high profile, or reverse copper foils to increase their adhesive strength as was well known in the art as shown for example by Yates et al.

Yates et al. disclose that it was known to treat copper foils to produce high profile, low profile, or reverse copper foils to increase the adhesion strength of the foils to a base substrate in forming metal clad laminates (e.g. PCBs) (Column 4, lines 38-67 and Column 5, lines 1-15).

Response to Arguments

7. Applicant's arguments filed 6/1/04 have been fully considered but they are not persuasive.

Applicant argues, "However, claims 1, 13 of the present invention is first coating isolating material onto the upper surface and the lower surface of the substrate by using a rolling process, and then metal foils without adhesive thereon are laminated onto the surfaces of the isolating layers."

The claims are not commensurate in scope with this argument, as the claims do not require metal foils without adhesive.

Applicant further argues, "In addition the curing step taught by Hosomi is performing after both the isolating material and the metal foils are laminated onto the internal layer circuit board."

Hosomi et al. teach prior to contacting the metal foils, coating isolating material (i.e. undercoating agent) onto the upper and lower surfaces of the internal PCB and then curing (at least partially) by irradiation the isolating material to form tack-free layers such that the limitation requiring curing of an insulating material before laminating the metal foils is met.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

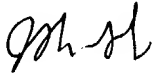
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John L. Goff** whose telephone number is **(571) 272-1216**. The examiner can normally be reached on M-F (7:15 AM - 3:45 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John L. Goff



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